

Experimental Design Rubric for B/C 2011

1. Statement of problem (2 Points)

- ☐ Not a yes/no question
- ☐ Independent and dependent variables included
- ☐ Problem is clearly testable
- ☐ Response is written in a clear and concise manner

2. Hypothesis (4 points)

- ☐ Statement predicts a relationship or trend
- ☐ Statement gives specific direction to the predictions(s): A stand is taken.
- ☐ Prediction includes both independent and dependent variables
- ☐ A rationale is given for the hypothesis.

3. Variables

Independent Variable (IV) (3 Points)

- ☐ IV correctly identified
- ☐ IV operationally defined
- ☐ At least three levels of IV given

Dependent Variable (DV) (3 points)

- ☐ (2) DV correctly identified
- ☐ DV operationally defined

Constants (Controlled Variables-CV) (4 points)

- ☐ One CV correctly identified
- ☐ Two CVs correctly identified
- ☐ Three CVs correctly identified
- ☐ Four CVs correctly identified

4. Experimental Control (2 points)

- ☐ SOC correctly identified
- ☐ The SOC makes logical sense for the experiment
- ☐ Reason given for selection of SOC

5. Materials (3 points)

- ☐ All materials used are listed
- ☐ All materials used are listed properly (no extras)
- ☐ Materials listed separately from procedure

6. Procedure: Including Diagrams (6 points)

- ☐ Procedure well organized
- ☐ Procedure is in a logical sequence
- ☐ Enough information is given so another could repeat procedure
- ☐ Diagrams used
- ☐ Repeated trials

7. Qualitative Observations (4 points)

- ☐ Observations about results given
- ☐ Observations about procedure/deviations
- ☐ Observations about results not directly relating to DV
- ☐ Observations given throughout the course of the experiment.

8. Quantitative Data - Data Table (6 points)

- ☐ All raw data is given
- ☐ All data has units
- ☐ Condensed table with most important data included
- ☐ Table(s) labeled properly
- ☐ Example calculations are given
- ☐ All data reported using correct significant figures C Division only)

9. Graph(s) (6 points)

- ☐ Appropriate type of graph used
- ☐ Graph has title
- ☐ Graph labeled properly (axes/series)
- ☐ Units included
- ☐ Appropriate scale used

10. Statistics **B Division** – (2 points)

- ☐ Average, median, mode, range, or drawn in line of best-fit

Division C (4 more points)

- ☐ Average, median, mode, range, or drawn in line of best-fit
- ☐ Measure of central tendency
- ☐ Measure of variation
- ☐ Regression analysis
- ☐ Other appropriate statistic used

11. Analysis and interpretation of data (4 points)

- ☐ All statements must be supported by the data.
- ☐ All data discussed and interpreted
- ☐ Unusual data points commented on
- ☐ Trends in data explained and interpreted
- ☐ Enough detail is given to understand data

12. Possible Experimental Errors (3 points)

- ☐ Possible reasons for errors are given
- ☐ Important info about data collection given
- ☐ Effect errors had on data discussed

13. Conclusion (4 points)

- ☐ Hypothesis is evaluated according to data
- ☐ Hypothesis is re-stated
- ☐ Reasons to accept/reject hypothesis given
- ☐ All statements are supported by the data

14. Applications and Recommendations for

Further Use (4 points)

- ☐ Suggestions for improvement of specific experiment are given
- ☐ Suggestion for other ways to look at hypothesis given
- ☐ Suggestions for future experiments given
- ☐ Practical application(s) of experiment given